

Tab 15
UNREDACTED
VERSION OF
DOCUMENT TO BE
SEALED PURSUANT
TO LR 5.3(b)(3)(B)(iii)

Message

From: Randy L. Melanson [/O=GM/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=D9A7A37C26F5454EBA951042EE05399E-FZH6R6]
Sent: 9/20/2018 2:58:28 PM
To: Andrew Scheich [andrew.scheich@gm.com]
Subject: RE: 8 Speed RWD Shudder: ATF Data
Attachments: Dexron HP 9986509Oct2016_Performance Deficiencies(v1)_20SE18.pptx

Hi Andrew,

Please see my comments in purple, as well as I've added a last slide w/ my personal opinion(s) as to responsibility. Bottom line is this: GM is responsible for the design of DexHP (212B) which is a "hard" oil with a weak friction modifier package resulting in high static friction that would have eventually caused significant shudder warranty by itself, without any help from water, but it would happen at higher mileage (30-40k miles or more is my estimate)

Water sensitivity, which no one knew about at the time, simply accelerated the warranty to much lower mileage and MIS exposure so GM, in my opinion is responsible for some of the warranty, while the oil companies (most likely Afton) would be responsible for not knowing the extreme water sensitivity of the oil (both 212B and Option B) that drove the bulk of the warranty, especially at low mileage. The extent to which these conclusions are prove-able will be the trick.

How we're going to split that baby is anyone's guess, but you know it's going to get ugly.....

Thanks,
Randy

From: Andrew Scheich
Sent: Thursday, September 20, 2018 8:53 AM
To: Elliott Walter <elliott.walter@gm.com>; Randy L. Melanson <randy.l.melanson@gm.com>; Maxim Burgman <max.burgman@gm.com>
Cc: Sara Mohre <sara.mohre@gm.com>; Nikki L Logsdon <nikki.logsdon@gm.com>; Shawn B. Look <shawn.b.look@gm.com>; Peter Radecki <peter.radecki@gm.com>; Robert J. Gonzales <robert.j.gonzales@gm.com>; Dan Cashatt <paul.cashatt@gm.com>; Victor M. Roses <victor.m.roses@gm.com>
Subject: RE: 8 Speed RWD Shudder: ATF Data

Yw. I added a few slides on viscosity based on my conversation with Max yesterday evening. We'll need some help from our labs to run to ground Option B as compared to the specification at 0.1% water content. Looking thru all the lab reports I cannot find that combination of 0.1% water content and KV40.

Thanks,
Andrew Scheich
Torque Converter Integration
Tel:248.880.5122
Andrew.Scheich@gm.com

From: Elliott Walter
Sent: Thursday, September 20, 2018 7:15 AM
To: Andrew Scheich <andrew.scheich@gm.com>; Randy L. Melanson <randy.l.melanson@gm.com>
Cc: Sara Mohre <sara.mohre@gm.com>; Nikki L Logsdon <nikki.logsdon@gm.com>; Shawn B. Look <shawn.b.look@gm.com>; Peter Radecki <peter.radecki@gm.com>; Robert J. Gonzales <robert.j.gonzales@gm.com>; Dan Cashatt <paul.cashatt@gm.com>; Victor M. Roses <victor.m.roses@gm.com>
Subject: RE: 8 Speed RWD Shudder: ATF Data



Thank you, Andrew. I appreciate your support on this one. While it is not a recovery that my team would lead specifically, I think we are doing the right thing for the company by digging into this a bit further and having the discussion as a cross functional team.

Elliott N. Walter

Global CT Leader
Clutches, Friction Plates
& Torque Converters
Global Propulsion Systems
☎ Cell: 248.904.8635

From: Andrew Scheich

Sent: Wednesday, September 19, 2018 4:49 PM

To: Elliott Walter <elliott.walter@gm.com>; Randy L. Melanson <randy.l.melanson@gm.com>

Cc: Sara Mohre <sara.mohre@gm.com>; Nikki L Logsdon <nikki.logsdon@gm.com>; Shawn B. Look <shawn.b.look@gm.com>; Peter Radecki <peter.radecki@gm.com>; Robert J. Gonzales <robert.j.gonzales@gm.com>; Dan Cashatt <paul.cashatt@gm.com>; Victor M. Roses <victor.m.roses@gm.com>

Subject: RE: 8 Speed RWD Shudder: ATF Data

Elliott,

I started pulling together a powerpoint with what I believe are the discussion points of the Performance Specification Afton (Exxon) will be in question over. I'm missing a few pieces of information that hopefully Randy can help fill in. Additionally I've attached the material specification and performance specification itself for your viewing pleasure.

Thanks,

Andrew Scheich

Torque Converter Integration
Tel:248.880.5122
Andrew.Scheich@gm.com

From: Elliott Walter

Sent: Wednesday, September 19, 2018 8:07 AM

To: Robert J. Gonzales <robert.j.gonzales@gm.com>; Victor M. Roses <victor.m.roses@gm.com>; Randy L. Melanson <randy.l.melanson@gm.com>; Dan Cashatt <paul.cashatt@gm.com>; Andrew Scheich <andrew.scheich@gm.com>

Cc: Sara Mohre <sara.mohre@gm.com>; Nikki L Logsdon <nikki.logsdon@gm.com>

Subject: 8 Speed RWD Shudder: ATF Data

Gentlemen,

A couple of you are aware (and all are welcome to participate) that we have a meeting this coming Monday to discuss whether or not Exxon Mobil has any financial responsibility for the warranty on 8 Speed RWD shudder. If you have any data that supports the case, would you please provide it to Sara (my CTL counterpart on the Fluids team), Nikki and myself as soon as possible so we can go through it before the meeting? I know we have mentioned some specification(s) that the ATF did not meet. Please provide the specification detail as well, along with anything else you may feel is pertinent. Any questions, please let me know. Thank you for your support.

Elliott N. Walter

Global CT Leader
Clutches, Friction Plates
& Torque Converters
Global Propulsion Systems
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Dexron HP 9986509Oct2016

Performance Specification GMW16974

Deficiencies

GMW16974 (Scope and Qualification Program)

1 Scope

1.1 Material Description. This mineral based group III plus (+) oil specification covers DEXRON® Automatic Transmission Fluid (ATF) primarily for use in General Motors automatic transmissions. This specification describes, in terms of laboratory and simulated service test results, the requirements for a minimum-performance fluid. The primary requirement is satisfactory performance in normally functioning transmissions under normal and severe conditions.

3.5 Requirements for New DEXRON® High Performance ATF Additive Chemistry Combinations.

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May 2017

Page 3 of 63

GM WORLDWIDE ENGINEERING STANDARDS

GMW16974

3.5.1 Successful completion of a complete DEXRON® High Performance ATF qualification program (see Table 1).

GMW16974 (Table 1) Water Content

Table 1: DEXRON® High Performance ATF Test Methods and Requirements

Test	Method	Requirement
Color	ASTM D1500	8.0 to 8.0
Elemental Analysis	ASTM E5185	Report, parts per million (ppm): Al, Ba, B, Ca, Cr, Cu, Fe, Pb, Mg, Mn, Mo, Ni, P, K, Si, Ag, Na, S, Sn, Ti, V, Zn
	ASTM D6443	Report, ppm: Cl
	ASTM D4629	Report, ppm: N
	ASTM D4627	Report, ppm: S
Fluid Profile	Fluid Profile Proprietary GM Test	Report
Miscibility and Homogeneity	ASTM D6822	No separation or color change at end of test using reference fluid
FE-STD-791	3430-Compatibility	Pass
	3440-Storage Solubility	Pass
Water Content	ASTM D6304	0.10% weight maximum
Density	ASTM D4052, 15 °C	Report
Kinematic Viscosity	ASTM D445	32 cSt at 40 °C (maximum)
		8.4 cSt at 100 °C (maximum)
		150 °C (Report)
Viscosity Index	ASTM D2270	145 (minimum)
Flash Point	ASTM D92	180 °C (minimum)
Fire Point	ASTM D92	195 °C (minimum)
Pour Point	ASTM E5049	-50 °C
Brookfield Viscosity	ASTM D2685	8000 cP (maximum) at 40 °C

I read this as performance of ATF should not be degraded below 0.10% water content from

Scope. describes, in terms of laboratory and simulated service test results, the requirements for a minimum-performance fluid. The primary requirement is satisfactory performance in normally functioning transmissions under normal and severe conditions.

GMW16974 (Table 1) 3 Day Wear Test

GM WORLDWIDE ENGINEERING STANDARDS

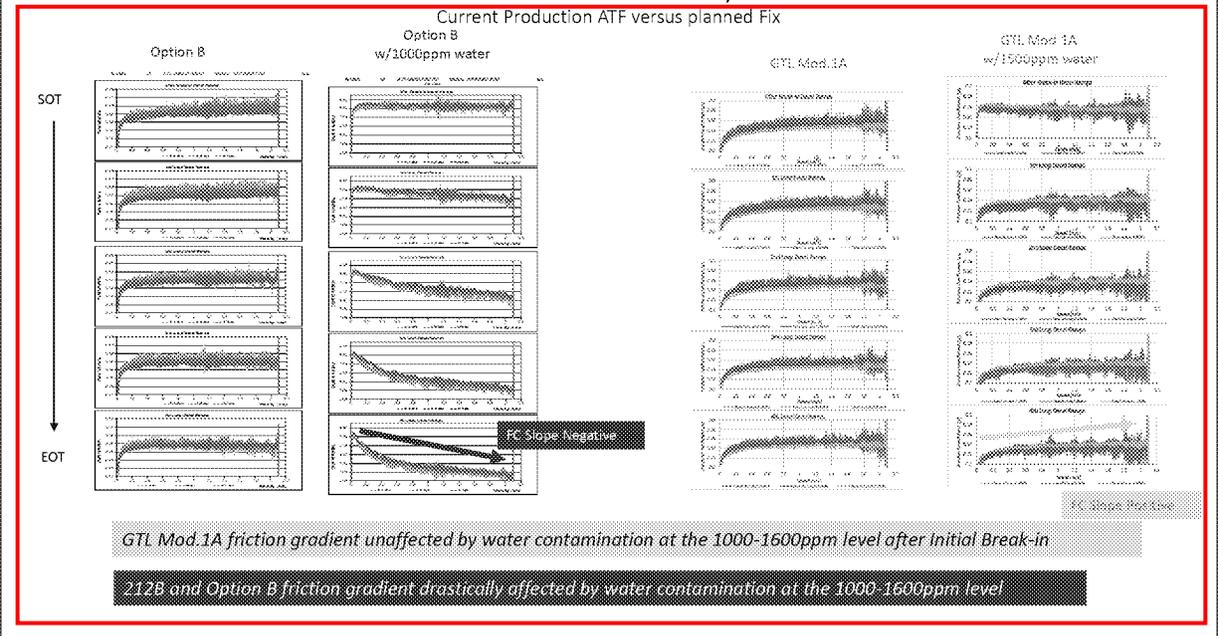
GMW16974

Test	Method	Requirement
Seal Test Reblend Program	Elastomer: Fluid Interaction Phase I Validation (Appendix B, Table B2, Schedule 1 only)	Report and Pass
Low-Speed Carbon Fiber Friction Test Use Production Intent Friction Material	Appendix J, Table J1 and Figure J1	New fluid must be equal to or better than the reference fluid. Report result from used (cycling test) fluid
GM Three (3) Day Wear Test Use Production Intent Friction Material	GM Test Procedure Appendix G	Report

- 1.) What is Pass/Fail Criteria of GM Three (3) Day Wear Test? *EOT average slope between 0.35-1.02 m/s > -0.0049 s/m (original Grimmer line), however this was not in place when 212B was production released*
- 2.) Was 212B 1000ppm 3 Day Wear Test Report shared with us prior to SOP? *No, it was only after 2015MY shudder warranty incidents were noticeably concentrated in southern states that water was suspected as a contributor of degraded friction performance. Significant slope degradation noted at the 1000ppm level.*

ATF Contamination on 3 day wear test

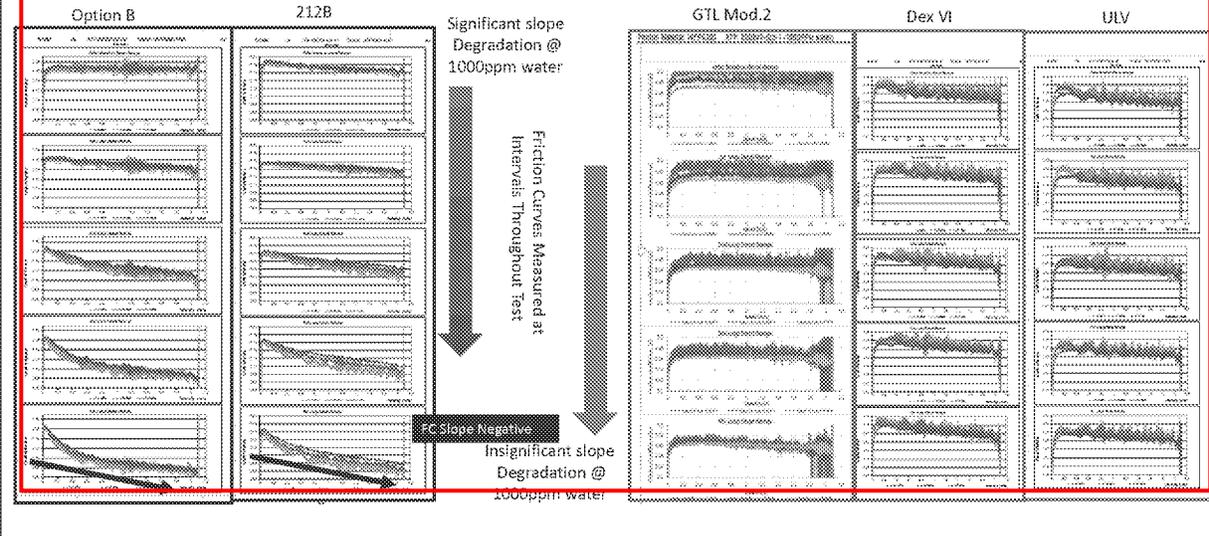
Current Production ATF versus planned Fix



ATF contamination on sae #2 3 day wear test

Current Production ATF versus others historically

- Original 8 Speed ATF (212B) & Option B are highly sensitive to water.
- Seen in data below, as well as vehicle testing, and ATF field samples measuring water.



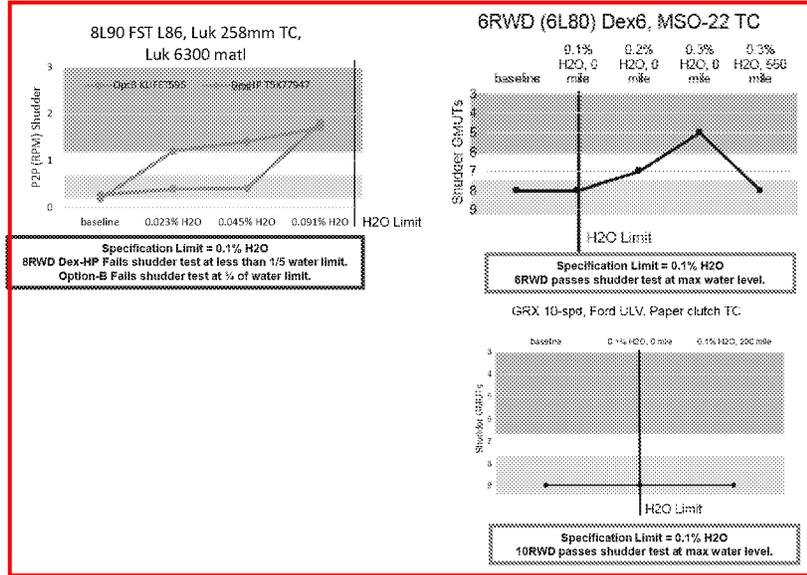
GMW16974 (Table 1) Low-Speed Friction Test

Test	Method	Requirement
Seal Test Reblend Program	Elastomer: Fluid Interaction Phase I Validation (Appendix B, Table B2, Schedule 1 only)	Report and Pass
Low-Speed Carbon Fiber Friction Test Use Production Intent Friction Material	Appendix J, Table J1 and Figure J1	New fluid must be equal to or better than the reference fluid. Report result from used (cycling test) fluid

1.) What are the results of this test with either WFP6300 or BW6100 with and without 1000ppm of water? *Not sure, would have to ask Afton. However, I doubt this would have been done w/ 1000ppm water, and results would probably be ok w/ no added water.*

GMWEAR testing was done in 2016 w/ MS022 (carbon fiber) in base 212B, and results were similar to, maybe slightly worse than, in Dex VI

Vehicle Water Sensitivity



GMW16974 (Table 1) Viscosity

Table 1: DEXRON® High Performance ATF Test Methods and Requirements

Test	Method	Requirement
Color	ASTM D1500	6.0 to 8.0
Elemental Analysis	ASTM D6185	Report, parts per million (ppm): Al, Ba, B, Ca, Cr, Cu, Fe, Pb, Mg, Mn, Mo, Ni, P, K, Si, Ag, Na, S, Sn, Ti, V, Zn
	ASTM D6443	Report, ppm: Cl
	ASTM D4629	Report, ppm: N
	ASTM D4927	Report, ppm: S
Fluid Profile	Fluid Profile Proprietary GM Test	Report
Miscibility and Homogeneity	ASTM D6922	No separation or color change at end of test using reference fluid
FE-STD-791	3450-Compatibility 3440-Storage Solubility	Pass Pass
Water Content	ASTM D6304	0-10% weight maximum
Density	ASTM D4052, 15 °C	Report
Kinematic Viscosity	ASTM D445	32 cSt at 40 °C (maximum)
		6.4 cSt at 100 °C (maximum)
		150 °C (Report)

1.) Do we have any reports that evaluated the Kinematic Viscosity at KV40 w/ 1000ppm of water? Based on our observations at Luk's lab testing I'm wondering if we'd exceed this specification? *This is a question best answered by our Fluids group.....*

Final Comments on History of Dex-HP/212B

- Original DexHP/212B was designed and approved by GM, and even without water sensitivity, in the opinion of Starting Devices TS, would have generated significant shudder warranty, albeit at higher mileage
 - *Internal predictions were that shudder would start appearing in the 30-40k mile/18-36 MIS timeframe*
- Water sensitivity of DexHP, unknown by anyone at the time of release, simply moved this timeline forward
- *Question is should Afton/Exxon have known about water sensitivity of Dex HP, since it clearly aggravated and accelerated shudder warranty claims?*